

**The Pseudoscorpion Family Chthoniidae (Arachnida:  
Pseudoscorpionida) in Korea, with Two New Species from the Genus  
*Tyrannochthonius***

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**ABSTRACT**

As a result of this report, the pseudoscorpion family Chthoniidae in Korea comprises nine species in four genera. All species are collected mainly from the litter layer in wooded forests. The two new species, *Tyrannochthonius suppressalis* n. sp. and *Tyrannochthonius spinatus* n. sp., described herein occur on islands in the Yellow Sea.

Key words: Chthoniidae, Pseudoscorpionida, Arachnida, taxonomy, new species, Korea

**INTRODUCTION**

The pseudoscorpion fauna of the Korea is dominated by the family Chthoniidae. The Chthoniidae from Korea has been reported by Morikawa (1970), Lee (1982), Hong and Kim (1993), Kim and Hong (1994), and Lee and Seo (1995). The Korean Chthoniidae at present comprises 7 species from 4 genera. Materials were collected from April 1991 to June 1996. Among them we have come across two new species belonging to the genus *Tyrannochthonius* collected from the islands, Mal-do, Wi-do, Sönyu-do, and Pian-do. This report also deals with the descriptions of two new species and contains a key to the 9 species of Chthoniidae. Abbreviations used in this report are as follows:

CB; Ch'ungch'öngbuk-do, CJ; Cheju-do, CN; Ch'ungch'öngnam-do, CH'B; Chöllabuk-do, CH'N;

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Chöllanam-do, KB; Kyöngsangbuk-do, KG; Kyonggi-do, KN; Kyöngsangnam-do, and KW; Kangwön-do.

## SYSTEMATIC ACCOUNT

Order Pseudoscorpionida de Geer, 1778

Superfamily Chthonioidea Daday, 1931

Family Chthoniidae Daday, 1888

### 1. *Allochthonius (Allochthonius) buanensis* Lee, 1982 부안부채얹은뱅이

*Allochthonius buanensis* Lee, 1982, p. 76, figs. 1-2; Sato, 1984, p. 20, fig. 9; Harvey, 1990, p. 132; Hong and Kim, 1993, p. 1; Lee and Seo, 1995, p. 456, figs. 1a-d, 2a, 3a.

**Description.** Body length of males 1.36-1.46 mm. Carapacial chaetotaxy 10-4:24; tergal chaetotaxy 4-4-6-6-6(7)-8-8-8(9)-7; marginal teeth of fixed finger 16-19.

**Material examined.** CB: 5♀♀, 5♂♂, Chech'ön-gun, Mt. Worak, 7 May 1994; 8♀♀, 13♂♂, 16 trito, 2 deuto, Poün-gun, Mt. Songni, 8 June 1991; 1♀, 2♂♂, 3 trito, Tanyang-gun, Mt. Sobaek, 8 May 1994; 1♀, 1♂, Yöngdong-gun, Mt. Chüntae, 23 Dec. 1995. CJ: 1♀, 2♂♂, Mt. Halla, Kwanüm-sa, 21 Apr. 1996; 1♂, Mt. Halla, Söngp'anak, 20 Apr. 1996; 2 trito, 1 deuto, Mt. Halla, Yöngshil, 15 Oct. 1994; 1♀, 1♂, 2 trito, Sögwip'o-shi, Ipsök-dong, 16 Oct. 1994; 1♀, 1♂, 1 trito, 1 deuto, Pukcheju-gun, Pijarim, 19 Apr. 1996. CN: 4♀♀, 1 trito, Ch'öngyang-gun, Mt. Ch'ilgap, 22 Oct. 1994; 2♀♀, 1♂, 4 trito, 4 deuto, Kongju-gun, Mt. Kyeryong, Kap-sa, 11 May 1991; 4 trito, Kongju-gun, Mt. Kyeryong Tonghak-sa, 12 May 1991. CH'B: 14♀♀, 14♂♂, 8 trito, 7 deuto, 9 proto, Changsu-gun, Ch'önc'h'ön-myön, 15 June 1991; 1 deuto, Changsu-gun, Mt. Sokgüm, 23 June 1993; 3♀♀, 2♂♂, Chinan-gun, Chöngch'ön-myön, 8 May 1993; 1♀, Chinan-gun, Söngsu-myön, Taedu-san, 25 Jan. 1995; 7♀♀, 9♂♂, Chinan-gun, Mt. Unjang, 17 June 1995; 4♀♀, 2♂♂, 1 trito, Chönggü-gun, Mt. Naejang, 27 Apr. 1991; 4♀♀, 5♂♂, Imshil-gun, Mt. Hoemun, 6 June 1995; 7♀♀, 4♂♂, Koch'ang-gun, Mt. Sönnun, 6 May 1995; 2♀♀, 2♂♂, 1 trito, 1 deuto, Muju-gun, Mt. Tögyu, 22 June 1991; 2♀♀, 3 trito, Namwon-gun, Mt. Chiri, 28 May 1991; 3♀♀, 4♂♂, 3 trito, Okku-gun, Mal-do, 19 Aug. 1994; 3♀♀, 5♂♂, 2 trito, Okku-gun, Munyö-do, 23 June 1995; 6♀♀, 5♂♂, Okku-gun, Pian-do, 23 June 1995; 1♂, Okku-gun, Sönyu-do, 22 June 1995; 1♀, 3♂♂, Puan-gun, Chungkye-ri, 22 May 1993; 2♀♀, 3♂♂, Puan-gun, Pyönsan-myön, 8 Apr. 1995; 1♀, 15♂♂, 15 trito, 15 deuto, 3 proto, Puan-gun, Sangsö-myön, 17 Aug. 1991; 1♀, 2♂♂, 1 trito, Puan-gun, Sik-do, 22 Feb. 1995; 5♀♀, 2♂♂, 3 trito, Puan-gun, Wi-do, 21 Feb. 1995; 1♀, Wanju-gun, Hwasan-myön, 4 Sep. 1994; 1♀, 4♂♂, 5 trito, 6 deuto, 1 proto, Wanju-gun, Mt. Moak, 14 July 1991; 4♀♀, 2♂♂, 1 trito, 1 deuto, Wanju-gun, Mt. Taedun, 24 Sep. 1994; 1♀, 5♂♂, 6 trito, 3 deuto, 2 proto, Wanju-gun, Tongsang-myön, 29 July 1991; 2♀♀, 2♂♂, Wanju-gun, Unju-myön, 15 Sep. 1995. CH'N: Kurye-gun, Mt. Chiri, P'iagol - 1♂, 5 trito, 2 deuto, 19 Mar. 1993; 7♂♂, 5 trito, 4 deuto, 2 proto, 18 Apr. 1993; 11♀♀, 34♂♂, 41 trito, 17 deuto, 4 proto, 16 May 1993; 11♀♀, 35♂♂, 14 trito, 8 deuto, 9 proto, 10 June 1993; 8♀♀, 29♂♂, 1 trito, 16 deuto, 23 proto, 11 July 1993; 35♀♀, 34♂♂, 13 trito, 64 deuto, 211 proto, 18 Aug. 1993; 12♀♀, 20♂♂, 16 trito, 162 deuto, 219 proto, 12 Sep. 1993; 4♀♀, 6♂♂

♂, 6 trito, 38 deuto, 96 proto, 10 Oct. 1993; 1 ♂, 2 trito, 1 proto, 14 Nov. 1993; 2 trito, 19 Dec. 1993; 1 deuto, 1 proto, 9 Jan. 1994; 2 trito, 2 deuto, 19 Mar. 1994; 2 ♀♀, 1 ♂, 10 trito, 5 deuto, 5 proto, 10 Apr. 1994; 11 ♀♀, 32 ♂♂, 17 trito, 38 deuto, 32 proto, 18 May 1994; 31 ♀♀, 68 ♂♂, 26 trito, 25 deuto, 22 proto, 12 June 1994; 5 ♀♀, 16 ♂♂, 4 trito, 19 proto, 10 July 1994; 10 ♀♀, 17 ♂♂, 10 trito, 18 deuto, 110 proto, 6 Aug. 1994; 16 ♀♀, 40 ♂♂, 74 trito, 154 deuto, 190 proto, 11 Sep. 1994; 5 ♀♀, 5 ♂♂, 12 trito, 29 deuto, 41 proto, 2 Oct. 1994; 1 trito, 1 deuto, 4 proto, 6 Nov. 1994; 5 ♀♀, 2 ♂♂, 2 trito, Kwangju-shi, Mt. Mudŭng, 8 Oct. 1994; 1 ♀, 6 ♂♂, 2 trito, 3 deuto, 1 proto, Shinan-gun, Hŭksan-do, 3 Aug. 1991; 3 ♀♀, 3 ♂♂, 1 trito, Sŭngju-gun, Mt. Chogyŏ, 5 Mar. 1995; 2 ♀♀, 2 ♂♂, 1 trito, 2 deuto, Yŏngam-gun, Mt. Wolch'ul, 21 July 1991. KB: 2 deuto, Chŏngsong-gun, Mt. Chuwang, 20 Oct. 1995; 1 ♂, Kŏch'ang-gun, Mt. Kaya, 22 Dec. 1995; 1 ♂, 1 trito, 2 deuto, Taegu-shi, Mt. P'algong, 11 Oct. 1991. KW: 9 ♂♂, 4 trito, Chŏngsŏn-gun, Yŏryang-ri, Panyun-san, 2 June 1991; 1 ♀, 2 trito, 6 deuto, Inje-gun, Mt. Sŏrak, Paekdam-sa, 14 Sep. 1991; 1 ♀, 3 ♂♂, Wonju-shi, Mt. Ch'iaek, 11 Apr. 1996.

**Distribution.** Korea.

## 2. *Allochthonius (Allochthonius) coreanus* (Morikawa, 1970) 부채앞은뱅이

*Allochthonius opticus coreanus* Morikawa, 1970, p. 141, figs. 1, 2a-b.

*Allochthonius coreanus*: Harvey, 1990, p. 133; Lee and Seo, 1995, p. 460, figs. 2b, 3c, 5a-d.

**Description.** Body length of female 2.20 mm. Carapacial chaetotaxy 10-4:28; tergal chaetotaxy 4-7-7-9-9-10-12-9-8. Palpal femur 1.04 mm, 4.2 times as long as broad; marginal teeth of movable and fixed fingers 25 and 30, respectively.

**Material examined.** CH'N: Kurye-gun, Mt. Chiri, P'iagol - 1 ♀, 10 Oct. 1993; 1 ♀, 10 Apr. 1994; 1 ♂, 18 May 1994; 1 ♀, 2 Oct. 1994; 2 ♂♂, 6 Nov. 1994; 1 ♀, Kwangju-shi, Mt. Mudŭng, 5 Mar. 1995; 1 ♂, Sŭngju-gun, Mt. Chogyŏ, 5 Mar. 1995.

**Distribution.** Korea.

## 3. *Allochthonius (Allochthonius) opticus* (Ellingsen, 1907) 극동부채앞은뱅이

*Chthonius opticus* Ellingsen, 1907, p. 16.

*Allochthonius opticus*: Chamberlin, 1929, p. 154; Beier, 1932, p. 61; Morikawa, 1955, p. 215; Sato, 1984, fig. 9; Harvey, 1990, p. 132; Lee and Seo, 1995, p. 459, figs. 3b, 4a-d.

*Allochthonius anthracinus* Morikawa, 1952, p. 250, fig. 1.

*Allochthonius yanoi* Morikawa, 1952, p. 251, figs. 2-4.

*Allochthonius (Allochthonius) opticus*: Morikawa, 1960, p. 97; Morikawa, 1962, p. 418, figs. 1, 3-5.

*Allochthonius (Allochthonius) opticus opticus*: Morikawa, 1960, p. 99, pl. 1 figs. 3-4, pl. 5 fig. 1, pl. 9 fig. 1, pl. 10 figs. 10-12; Morikawa, 1962, fig. 5.

**Description.** Male and female very similar, but female usually slightly bigger. Body and palp yellowish brown in color; body length of males 2.08-2.24 mm, and of female 2.34 mm.

Carapace. A little longer than broad with 4 conspicuous eyes; carapacial chaetotaxy 10-6-6-2-4.

Abdomen. Tergal chaetotaxy 4-7-7-8(7)-10(11)-12(10)-11(12)-14(12)-8(10)-6.

Chelicera. Distinctly shorter than carapace; hand with 6 setae; flagellum with 9-10 pinnate setae; fixed finger with 1-3 big and 1-3 small teeth, movable finger with 16-19 teeth; serrula exterior with

18-22 blades.

**Pedipalp.** Generally similar to that of other species in the genus; femur 4.00-5.01, tibia 1.75-2.48 and chela 3.09-4.11 times as long as broad; hand 1.21-1.65 times as long as deep; movable finger 1.45-1.66 times as long as hand; female palp slightly bigger than that in male. Fixed finger with 22-28 tall marginal teeth; movable finger with 18-22 similar marginal teeth.

**Leg.** Entire femur of leg IV 2.79-3.15 and tibia 3.95-4.39 times as long as deep. Coxa I with 8-9 coxal spines, branched several times.

**Measurements (mm)** (based on 4 males and 2 females). Body length 2.08-2.34. Carapace length 0.54-0.65. Chelicera 0.45-0.59 in length. Palpal trochanter 0.20-0.26 by 0.17-0.22; femur 0.74-1.02 by 0.18-0.25; tibia 0.32-0.43 by 0.16-0.24; chela 1.10-1.52 by 0.27-0.49; hand 0.44-0.60 by 0.27-0.49; movable finger 0.66-0.93 in length. Leg IV; entire femur 0.57-0.76 by 0.20-0.27; tibia 0.45-0.65 by 0.11-0.16; basitarsus 0.24-0.32 by 0.09-0.12; telotarsus 0.41-0.58 by 0.06-0.09.

**Material examined.** CJ: 1♀, Mt. Halla, Kwanŭm-sa, 21 Apr. 1996; 1♀, 1♂, Mt. Halla, Sŏngp'anak, 20 Apr. 1996; 1♀, Mt. Halla, Yŏngshil, 15 Oct. 1994. CN: 1♀, 1♂, Kongju-gun, Mt. Kyeryong, 11 Nov. 1994; 1♀, 1♂, Poryŏng-gun, Mt. Sungju, 16 Mar. 1996. CH'B: 1♂, Chinan-gun, Chŏngch'ŏn-myŏn, 28 May 1993; 1♂, Chinan-gun, Sŏngsu-myŏn, Naedong-san, 18 Jan. 1995; 1♀, 1♂, Chinan-gun, Sŏngsu-myŏn, Taedu-san, 25 Jan. 1995; 1♂, Chinan-gun, Mt. Unjang, 17 June 1995; 4♂♂, Koch'ang-gun, Mt. Sŏnun, 6 May 1995; 2♂♂, Muju-gun, Mt. Cheŭgsan, 23 Dec. 1995; 1♀, Namwon-gun, Mt. Chiri, Paemsagol, 25 Apr. 1992; 3♀♀, Wanju-gun, Mt. Moak, 18 Mar. 1995. CH'N: Kurye-gun, Mt. Chiri, P'iagol - 1♀, 10 Oct. 1993; 1♀, 1♂, 19 Dec. 1993; 2♂♂, 6 Nov. 1994; 1♂, Changhŭng-gun, Mt. Ch'unkwan, 16 Feb. 1996; 3♀♀, Haenam-gun, Mt. Turyun, 15 Feb. 1996; 2♀♀, 5♂♂, Kwangju-shi, Mt. Mudŭng, 8 Oct. 1994.

**Distribution.** Korea and Japan.

#### 4. *Mundochthonius minusculus* Kim and Hong, 1994 천왕꼬마앗은뱅이

*Mundochthonius minusculus* Kim and Hong, 1994, p. 47, pl. 1a-d, figs. 1-4.

**Description.** Femur 0.24-0.27 mm, 2.6-3.2 times as long as broad, and carapacial chaetotaxy 4-6-6-6. Number of teeth on movable and fixed fingers 40-46 and 41-45, respectively.

**Material examined.** CJ: 1♂, Mt. Halla, Yŏngshil, 15 Oct. 1994; 2♀♀, 2♂♂, Pukcheju-gun, Pijarim, 19 Apr. 1996. CN: 1♂, Kongju-gun, Mt. Kyeryong, Tonghak-sa, 19 Apr. 1992. CH'N: Kurye-gun, Mt. Chiri, P'iagol - 3♀♀, 7♂♂, 4 deuto, 19 Mar. 1993; 2♀♀, 18 Apr. 1993; 20♀♀, 15♂♂, 57 deuto, 16 May 1993; 8♀♀, 11♂♂, 6 Feb. 1994; 16♀♀, 10♂♂, 18 May 1994; 1♀, 5♂♂, 6 Nov. 1994; 1♂, 10 Dec. 1994; 2♀♀, 2♂♂, Haenam-gun, Mt. Turyun, 15 Feb. 1996; 2♀♀, 1 trito, Sŭngju-gun, Mt. Chogyŏ, 5 Mar. 1995; 5♀♀, Wando-gun, Wan-do, 16 Feb. 1996. KB: 1 deuto, Taegu-shi, Mt. P'algong, 11 Oct. 1991; 3♀♀, 3♂♂, Ulleung-gun, Ulleung-do, 29 Sep. 1995 (S.S. Choi).

**Distribution.** Korea.

#### 5. *Mundochthonius bifurcatus* Kim and Hong, 1994 법주꼬마앗은뱅이

*Mundochthonius bifurcatus* Kim and Hong, 1994, p. 48, pl. 1e-h, figs. 5-9.

**Description.** Femur 0.35-0.39 mm, 2.9-3.6 times as long as broad, and carapacial chaetotaxy 4-4-

6-6-6. Number of teeth on movable and fixed fingers 56-60 and 60-64, respectively.

**Material examined.** CJ: 1 ♂, Mt. Halla, Söngp'anak, 20 Apr. 1996. CN: 3 ♀ ♀, 3 ♂ ♂, Ch'onan-shi, Mt. Heuksung, 15 Mar. 1996; 3 ♀ ♀, 4 ♂ ♂, Ch'öngyang-gun, Mt. Ch'ilgap, 22 Oct. 1994; 1 ♀, 3 ♂ ♂, Kongju-gun, Mt. Kyeryong, 2 May 1992. CH'B: 1 deuto, Chinan-gun, Söngsu-myön, Taedu-san, 18 Jan. 1995; 4 ♀ ♀, 1 ♂, 3 proto, Okku-gun, Öch'öng-do, 21 June 1995; 1 ♀, Puan-gun, Pyönsan-myön, 8 Apr. 1995; 1 ♀, 3 ♂ ♂, 2 trito, 1 deuto, Wanju-gun, Hwasan-myön, 4 Sep. 1994; 7 ♀ ♀, 7 ♂ ♂, 2 trito, Wanju-gun, Kosan-myön, 3 Mar. 1995. KB: 1 ♂, Taegu-shi, Mt. P'algong, 11 Oct. 1991. KN: 5 trito, Ch'ungmu-shi, Ch'ungyöl-sa, 15 Sep. 1994 (W.K. Lee). KW: 1 ♀, Chöngsön-gun, Yöryang-ri, Panyun-san, 2 June 1991.

**Distribution.** Korea.

### 6. *Pseudotyrannochthonius dentifer* (Morikawa, 1970) 톱니꼬마얏은뱅이

*Allochthonius* (*Spelaeochthonius*) *dentifer* Morikawa, 1970, p. 144, figs. 2c-e, 3.

*Pseudotyrannochthonius dentifer*: Harvey, 1990, p. 198.

**Description.** Eyes absent. Body length of female 2.32 mm; palpal femur 1.30 mm, 6.0-7.2 times as long as broad; carapacial chaetotaxy 6-2:16. Marginal teeth of movable and fixed fingers 36 and 31, respectively.

**Distribution.** Korea.

### 7. *Tyrannochthonius assimilis* Hong and Kim, 1993 어리꼬마얏은뱅이

*Tyrannochthonius assimilis* Hong and Kim, 1993, p. 2, figs. 1-4.

**Description.** Presence of a preocular dwarf seta on carapace; 4 setae on tergites from 1 to 4, 4-6 setae on tergites from 5 to 7, and 6 setae on tergites from 8 to 9; chelal length 0.56-0.66 mm.

**Material examined.** CH'B: 4 trito, Kunsan-shi, Osik-do, 12 Nov. 1993; 2 ♀ ♀, 6 ♂ ♂, 2 trito, Okku-gun, Öch'öng-do, 21 June 1995. CH'N: 3 ♀ ♀, 2 ♂ ♂, 1 trito, Haenam-gun, Mt. Dallma, 15 Feb. 1996; 1 ♀, 1 trito, Haenam-gun, Mt. Turyun, 15 Feb. 1996; 5 ♀ ♀, 1 deuto, Shinan-gun, Hüksan-do, 3 Aug. 1991; 1 ♂, Wando-gun, Wan-do, 16 Feb. 1996; 1 ♀, Yösu-shi, Odong-do, 19 May 1995 (W.K. Lee). KN: 1 ♀, 4 trito, Kosöng-gun, Kosöng, 15 Sep. 1994 (W.K. Lee).

**Distribution.** Korea.

### 8. *Tyrannochthonius suppressalis* Hong, n. sp. (Fig. 1)

**Diagnosis.** Carapace with a preocular dwarf seta; tergites from 1 to 6 with 4 setae, with 6 setae on tergites 7 and 8, and 4-5 setae on tergites 9 and 10, respectively; chelal length 0.63-0.75 mm.

**Description.** (based on 5 males and 1 female). Male and female similar, though female slightly bigger. Body and palps yellowish brown in color; surface smooth; body length of males 1.14-1.23 mm, and of female 1.38 mm.

Carapace. A little longer than broad, weakly narrowed posteriorly; the anterior margin flattened, epistome reduced, the 2 median setae on anterior margin of carapace lie close to base of epistome; with 4 conspicuous eyes; carapacial chaetotaxy d4d-4-4-2-2, the dwarf seta(d) lying anterior and ventral to eyes.

Abdomen. Tergal chaetotaxy of holotype (male) 4-4-4-4-4-6-6-5-4-4-0; others similar. Anterior operculum of genital complex with 11 setae and posterior operculum with 38 setae on each side of

genital opening in male; maxilla with two setae on the apical process.

Chelicera. About 3/4 as long as carapace; hand with 5 setae; flagellum with 6-7 simple pinnate setae; fixed finger with 7-9 small teeth, the distal one the biggest; movable finger with 15-17 small teeth; galea slightly elevated at the margin of finger.

Pedipalp. Slender; length of hand equal to finger; femur 4.18-5.14, tibia 1.48-1.96 and chela 3.96-4.99 times as long as broad; hand 2.02-2.28 times as long as deep; movable finger 0.96-1.21 times as long as hand. Trichobothria generally long and thin. Hand with one small spine-like seta medio-laterally near base of fixed finger; on movable finger *sb* slightly nearer to *b* than to *st*. Fixed finger with 16 widely spaced macrodenticles and distal half of movable finger with 7 spaced macrodenticles and 1-5 interspersed microdenticles, minute teeth basally.

Leg. Rather slender; entire femur of leg IV 2.32-2.40 and tibia 2.58-4.00 times as long as deep. Coxa I without the basal seta on apical projection; coxa II with approximately 8 or 9 terminally incised coxal spines. Intercoxal tubercle wanting.

**Measurements (mm).** Figures given first are for the holotype; those in parentheses represent ranges of the 5 paratypes. Body length 1.22 (1.14-1.38). Carapace length 0.45 (0.41). Chelicera 0.29 (0.26-0.33) long. Palpal trochanter 0.17 (0.15-0.19) by 0.11 (0.09-0.13); femur 0.48 (0.46-0.53) by 0.11 (0.09-0.13); tibia 0.19 (0.16-0.19) by 0.09 (0.10-0.13); chela 0.66 (0.63-0.75) by 0.14 (0.13-0.19); hand 0.30 (0.29-0.38) by 0.14 (0.13-0.19); movable finger 0.37 (0.34-0.37) long. Leg IV; entire femur 0.45-0.50 by 0.19-0.21; tibia 0.32 (0.29-0.33) by 0.09 (0.07-0.09); basitarsus 0.15 (0.14-0.16) by 0.06 (0.05-0.07); telotarsus 0.33 (0.31-0.34) by 0.04 (0.04-0.05).

**Tritonymph.** Carapace. With 4 developed eyes; epistomal process almost flat; carapacial chaetotaxy d4d-4-4-2-2.

Abdomen. Tergal chaetotaxy 4-4-4-4-4-4-6-; maxilla with 2 setae on the apical process; coxa II with 7 branched coxal spines.

Chelicera. Hand with 5 setae.

Pedipalp. On movable finger *sb* not seen; fixed finger with 13 widely spaced denticles and movable finger with 7 denticles. One small and not-strong spine-like seta at the base of fixed finger.

**Deutonymph.** Carapace. With 4 eyes.

Abdomen. Tergal chaetotaxy 4-4-4-4-4-4-4-4-; coxa II with 4 branched coxal spines.

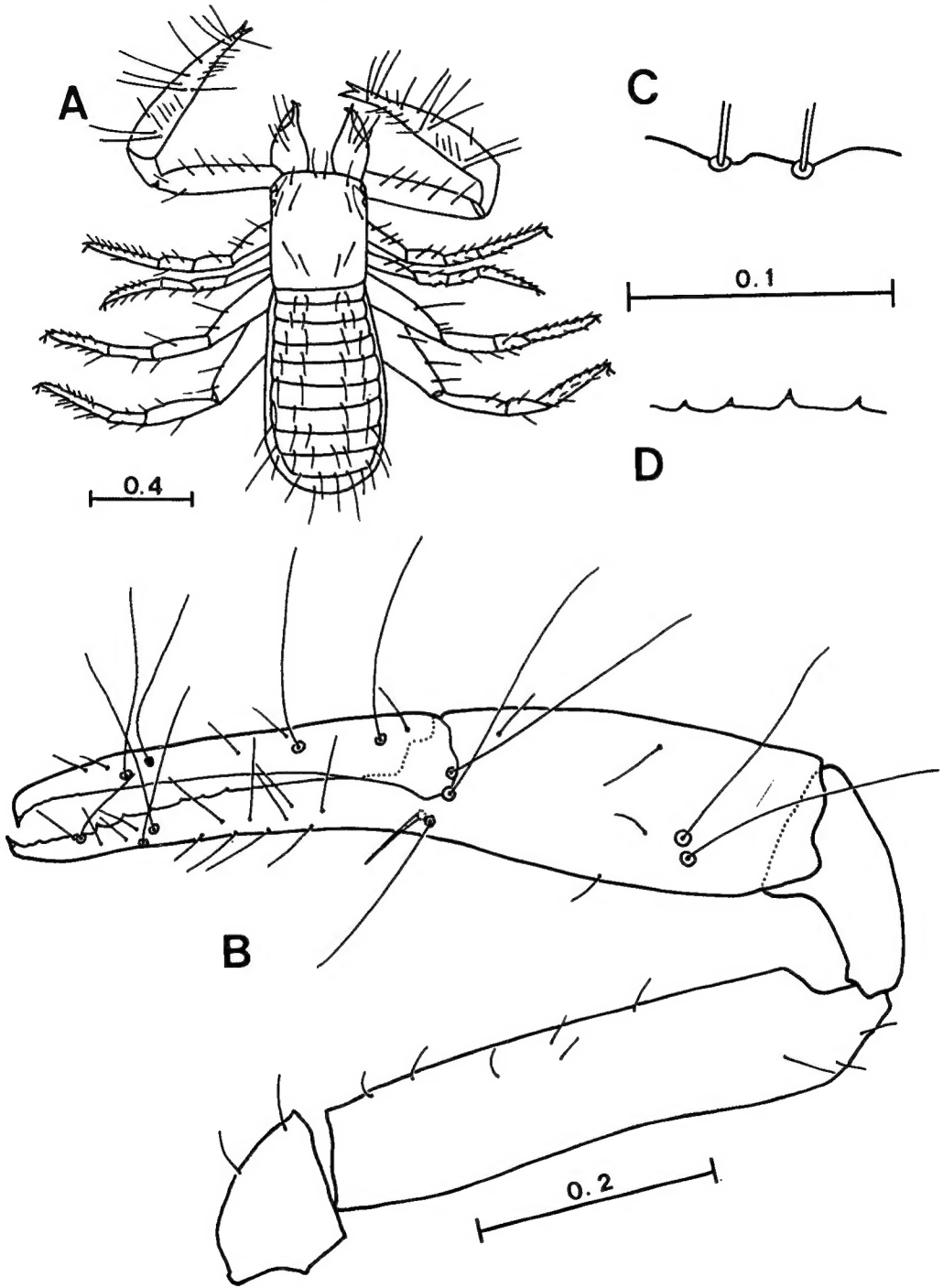
Pedipalp. On movable finger *b* not seen; fixed finger with 10 denticles, and movable finger with 5-8 denticles. One small and not-strong spine-like seta at the base of fixed finger.

**Type material.** Holotype (male) and 5 paratypes (4 males and 1 female) from Chöllabuk-do, Okku-gun, Mal-do, 19 Aug. 1994 (Y. Hong). Deposited in the Chonbuk National University.

**Additional material examined.** CH'B: 3 ♂ ♂, 1 trito, 1 deuto, Okku-gun, Mal-do, 19 Aug. 1994; 1 ♂, Puan-gun, Wi-do, 21 Feb. 1995.

**Distribution.** Korea.

**Remarks.** The present species appears to be closely related to *T. assimilis* Hong and Kim, 1993 from Mt. Wolchul (chelal length 0.56-0.66), but is separated easily by bigger size. This species is about the same size as *T. swiftae* Muchmore, 1993 (palpal femur L/B = 4.2-5.1 compared with 4.4 in *T. swiftae*), but it is distinguishable by the finger/hand ratio and tergal chaetotaxy. Also, *T. imitatus* Hoff, 1959 from Jamaica appears resembled when chelal finger/movable finger length ratio is concerned, but is separated by the shape of epistomal process.



**Fig. 1.** *Tyrannochthonius suppressalis* n. sp.: A, body; B, pedipalp; C, epistomal process; D, teeth; scales in mm.

### 9. *Tyrannochthonius spinatus* Hong, n. sp. (Fig. 2)

**Diagnosis.** Carapace with a preocular dwarf seta; tergites from 1 to 3 with 4 setae, tergites from 4 to 8 with 5-7 setae; with 4 eyes, and two spine-like setae on the medial side of the palpal chela.

**Description** (based on 4 males and 4 females). Male and female similar, though female slightly bigger. Body and palps yellowish brown in color; surface smooth; body length of males 1.01-1.24 mm, and of females 1.26-1.36 mm.

**Carapace.** A little longer than broad, weakly narrowed posteriorly; the anterior margin with a small, triangular epistomal process reduced, barely evident between the 2 median setae; with 4 conspicuous eyes; carapacial chaetotaxy d4d-4-4-2-2, the dwarf seta(d) lying anterior and ventral to eyes.

**Abdomen.** Tergal chaetotaxy of holotype (male) 4-4-4-6-6-6-6-6-4-4-0; sternal chaetotaxy of female 10-14-14-9-9-9-11-12-9-2(2); others similar. Maxilla with two setae on the apical process. Anterior operculum of genital complex with 10 setae and posterior operculum with 30 setae on each side of genital opening in male. Anterior and posterior genital opercula of female with 10 and 14 setae, respectively.

**Chelicera.** About 3/4 as long as carapace; hand with 5 setae; flagellum with 8-10 pinnate setae; fixed finger with 5-10 small teeth, the distal one the biggest; movable finger with 10-13 small teeth.

**Pedipalp.** Slender in shape; femur 3.12-3.93, tibia 1.61-1.84 and chela 3.84-4.89 times as long as broad; hand 1.18-1.70 times as long as deep; movable finger 1.76-2.26 times as long as hand. Hand with two strong spine-like setae medially near base of fixed finger; on movable finger *sb* situated midway between *st* and *b* or slightly nearer to *b*. Fixed finger with 14-18 widely spaced macrodenticles and 13-17 interspersed, acute microdenticles; distal half of movable finger with 9-10 spaced macrodenticles, 18 interspersed microdenticles, and minute teeth basally.

**Leg.** Rather slender; entire femur of leg IV 2.01-2.24 and tibia 2.18-3.71 times as long as deep; absence of a small seta at the base of apical projection of the coxa I; coxa II with a row of approximately 9 coxal spines. Intercoxal tubercle wanting.

**Measurements (mm).** Figures given first are for the holotype; those in parentheses represent ranges of the 7 paratypes. Body length 1.03 (1.01-1.36). Carapace length 0.37 (0.38-0.45). Chelicera 0.32 (0.30-0.34) long. Palpal trochanter 0.14 (0.15-0.19) by 0.11 (0.10-0.12); femur 0.37 (0.38-0.41) by 0.11 (0.11-0.13); tibia 0.17 (0.18-0.20) by 0.09 (0.10-0.12); chela 0.55 (0.56-0.62) by 0.13 (0.13-0.16); hand 0.18 (0.18-0.22) by 0.13 (0.13-0.16); movable finger 0.37 (0.38-0.42) long. Leg IV; entire femur 0.35 (0.35-0.39) by 0.17 (0.17-0.19); tibia 0.25 (0.24-0.28) by 0.08 (0.07-0.12); basitarsus 0.11 (0.08-0.13) by 0.06 (0.05-0.07); telotarsus 0.24 (0.23-0.26) by 0.04 (0.04-0.05).

**Tritonymph.** Body 0.86 mm in length.

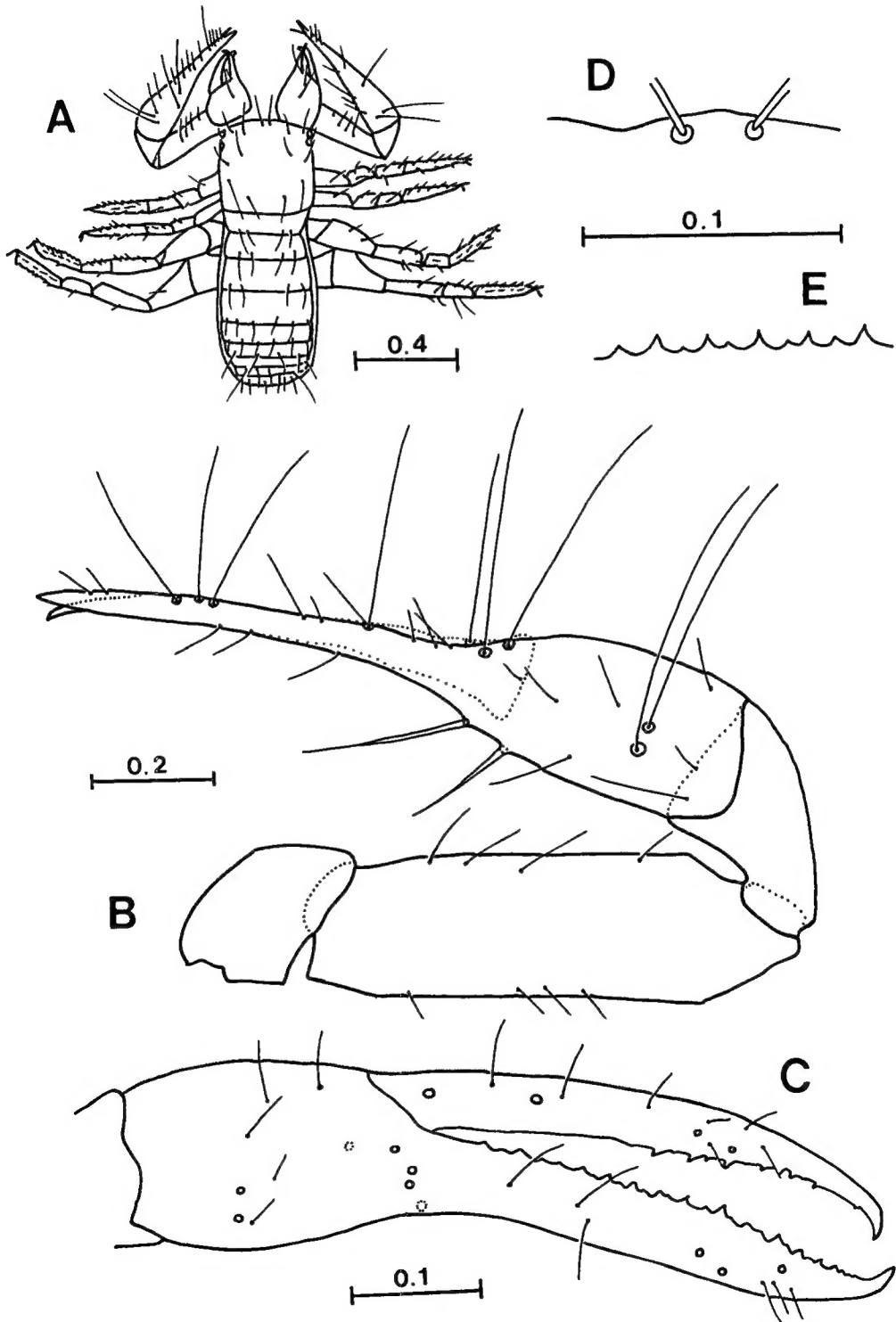
**Carapace.** With 4 eyes; carapacial chaetotaxy d4d-4-4-2-2.

**Abdomen.** Tergal chaetotaxy 4(5)-4-4-6(5)-6-6-.

**Pedipalp.** Femur 2.95, tibia 1.44 and chela 4.18 times as long as broad; hand 1.51 times as long as deep; movable finger 1.77 times as long as hand. Two spine-like setae near the base of fixed finger.

**Leg.** Entire femur of leg IV 2.16 and tibia 3.24 times as long as deep.





**Fig. 2.** *Tyrannochthonius spinatus* n. sp.: A, body; B, pedipalp; C, chela; D, epistomal process; E, teeth; scales in mm.

Measurements (mm). Body length 0.86. Chelicera 0.21 long. Palpal trochanter 0.10 by 0.08; femur 0.25 by 0.09; tibia 0.12 by 0.08; chela 0.41 by 0.10; hand 0.15 by 0.10; movable finger 0.26 in length. Leg IV; entire femur 0.23 by 0.11; tibia 0.15 by 0.05; basitarsus 0.08 by 0.03; telotarsus 0.15 by 0.03.

**Deutonymph.** Carapace. With 4 conspicuous eyes; carapacial chaetotaxy 4-4-4-2-2.

Abdomen. Tergal chaetotaxy 4-4-4-5-6-6-6.

Chelicera. Hand with 5 setae.

Pedipalp. Fixed finger with 11-12 macrodenticles and 12-13 interspersed, acute microdenticles; movable finger with 8-9 spaced macrodenticles, 3-4 interspersed microdenticles. Two spine-like setae near the base of fixed finger.

**Protonymph.** Carapace. Carapacial chaetotaxy 4-4-4-2-2.

Abdomen. Coxa II with 3 coxal spines.

Pedipalp. Fixed finger with 6 macrodenticles and 8 interspersed, acute microdenticles; movable finger with 6 spaced macrodenticles, 7 interspersed microdenticles.

**Type material.** Holotype (male) and 4 paratypes (2 males and 2 females) from Chöllabuk-do, Puan-gun, Wi-do, 21 Feb. 1995 (Y. Hong). 3 paratypes (1 male and 2 females) from Chöllabuk-do, Okku-gun, Sönyu-do, 22 June 1995. Deposited in the Chonbuk National University.

**Additional material examined.** CH'B: 10 ♀♀, 12 ♂♂, 3 trito, 3 deuto, 2 proto, Okku-gun, Sönyu-do, 22 June 1995; 4 ♀♀, 2 ♂♂, 1 trito, Okku-gun, Pian-do, 23 June 1995; 2 ♀♀, 2 ♂♂, 1 trito, 1 deuto, Puan-gun, Wi-do, 21 Feb. 1995.

**Distribution.** Korea.

**Remarks.** This species appears to be similar to *T. howarthi* Muchmore, 1979, but is distinguished by the number of eyes and that of spine-like setae close to the base of fixed finger.

### Key to the Species of Chthoniidae in Korea

1. Coxal spines on coxa I ..... 2
- Coxal spines on coxa II ..... 3
2. Eyes present ..... (Genus *Allochthonius*) 4
- Eyes not present (Genus *Pseudotyrannochthonius*) ..... *P. dentifer*
3. Marginal teeth on fingers of pedipalp short; with intercoxal tubercle between coxae III and IV ..... (Genus *Mundochthonius*) 6
- Marginal teeth on fingers of pedipalp tall and sharp; without intercoxal tubercle between coxae III and IV ..... (Genus *Tyrannochthonius*) 7
4. Body length of male longer than 2.50 mm; marginal teeth of movable and fixed fingers 25 and 30, respectively ..... *A. coreanus*
- Body length of male less than 2.50 mm; marginal teeth of fixed finger less than 25 ..... 5
5. Body length of male 2.08-2.24 mm; marginal teeth of fixed finger 17-24; carapacial chaetotaxy 8-4:26 or 10-4:28 ..... *A. opticus*
- Body length of male 1.36-1.46 mm; marginal teeth of fixed finger 16-19; carapacial chaetotaxy 10-4:24 ..... *A. buanensis*
6. Marginal teeth of fixed finger 44-46; femur length 0.24-0.27 mm; tergal chaetotaxy 4-6-6-6-6 ..... *M. minusculus*

- Marginal teeth of fixed finger 56-60; femur length 0.35-0.39 mm; tergal chaetotaxy 4-4-6-6-6  
..... *M. bifurcatus*
- 7. One not-strong spine-like seta medio-laterally near base of fixed finger ..... 8
- Two strong spine-like setae medio-laterally near base of fixed finger .....  
..... *Tyrannochthonius spinatus* n. sp.
- 8. Tergal chaetotaxy 4-4-4-4-4-5-5-6-; chelal length 0.56-0.66 mm; movable finger 1.40-1.52 times  
as long as hand ..... *T. assimilis*
- Tergal chaetotaxy 4-4-4-4-4-6-6-; chelal length 0.63-0.75 mm; movable finger 0.96-1.21 times  
as long as hand ..... *Tyrannochthonius suppressalis* n. sp.

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## REFERENCES

- Beier, M., 1932. Pseudoscorpionidea I. Subord. Chthoniinea et Neobisiinea. Tierreich, 57: i-xx, 1-258.
- Chamberlin, J.C., 1929. On some false scorpions of the suborder Heterosphyronida (Arachnida-Chelonethida). Canad. Ent., **61**: 152-155.
- Ellingsen, E., 1907. On some pseudoscorpions from Japan collected by Hans Sauter. Nytt Mag. Naturv., **45**: 1-17.
- Harvey, M.S., 1990. Catalogue of the Pseudoscorpionida. Manchester Univ. Press, 726 pp.
- Hoff, C.C., 1959. The pseudoscorpions of Jamaica. Part 1. The genus *Tyrannochthonius*. Bull. Inst. Jamaica, Sci. Ser., **10**(1): 1-39.
- Hong, Y. and T.H. Kim, 1993. A check list and key to the order Pseudoscorpiones of Korea with description of one new species from the genus *Tyrannochthonius*. Korean J. Entomol., **23**(1): 1-4.
- Kim, T.H. and Y. Hong, 1994. Two new species of Chthoniidae (Arachnida: Pseudoscorpiones) from Korea. Korean J. Syst. Zool., **10**(1): 47-53.
- Kobari, H., 1984. Seasonal fluctuations of some soil pseudoscorpions at Mt. Tsukuba, central Japan. Edaphologia, **30**: 1-10.
- Lee, W.K., 1982. Pseudoscorpions (Arachnida) from Korea II. A new species of the genes *Allochthonius*. Basic Sci. Rev. Chonbuk Nat. Univ., **5**: 75-80.
- Lee, W.K. and H.Y. Seo, 1995. Soil-inhabiting pseudoscorpions of the genus *Allochthonius* from Korea. Korean J. Syst. Zool., **11**(4): 455-468 (in Korean).
- Morikawa, K., 1952. Notes on the Japanese Pseudoscorpiones I. Mem. Ehime Univ., **1**(3): 249-258.
- Morikawa, K., 1955. Pseudoscorpions of forest soil in Shikoku. Mem. Ehime Univ., **2**(2): 215-222.
- Morikawa, K., 1960. Systematic studies of Japanese pseudoscorpions. Mem. Ehime Univ., (2B) **49**(1): 85-172.
- Morikawa, K., 1962. Ecological and some biological notes on Japanese pseudoscorpions. Mem. Ehime Univ.,

(2B) 4(3): 417-435.

Morikawa, K., 1970. Results of the speleological survey in South Korea 1966. XX. New pseudoscorpions from South Korea. Bull. Nat. Sci. Mus. Tokyo, **13**(2): 141-148.

Muchmore, W.B., 1979. The cavernicolous fauna of Hawaiian lava tubes. 11. A troglobitic pseudoscorpion (Pseudoscorpionida: Chthoniidae). Pacific Insects, **20**: 187-190.

Muchmore, W.B., 1993. An Epigean *Tyrannochthonius* from Hawaii (Pseudoscorpionida: Chthoniidae). Pan-Pacif. Entomol., **69**(2): 180-182.

Sato, H., 1984. Pseudoscorpions from the Ogasawara Islands. Proc. Jap. Soc. syst. Zool., **28**: 49-56.

Schawaller, W., 1995. Review of the pseudoscorpion fauna of China (Arachnida: Pseudoscorpionidea). Revue suisse Zool., **102**(4): 1045-1064.

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## 한국산 꼬마얹은뱅이과(거미강: 얹은뱅이목)의 분류

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## 요 약

1991년 4월부터 1996년 6월까지 전국의 산림토양에서 채집된 얹은뱅이 중 꼬마얹은뱅이과는 8종이었다. 이 중 *Tyrannochthonius suppressalis* n. sp. (가시꼬마얹은뱅이: 신칭), *Tyrannochthonius spinatus* n. sp. (가시어리꼬마얹은뱅이: 신칭)는 신종으로 이를 기재한다. 따라서 동굴산 *Pseudotyrannochthonius dentifer*와 함께 한국산 꼬마얹은뱅이는 총 4속 9종이 되며 이에 대한 검색표를 작성하였다.